THE INSTITUTE OF PHYSICS
47 BELGRAVE SQUARE, LONDON, S.W.1

BULLETIN

No. 19 *Information in this circular is not intended for general publication: your copy should not therefore be passed to a library.* JULY 1951

MEMBERS OF NOTE

Bernard Phineas Dudding, M.B.E., A.R.C.S., Ph.D. (*Honorary Secretary*). Born in 1885, Dr. Dudding began an indentured apprenticeship in the Royal Naval Dockyard, Chatham, in 1900. At the end of it he obtained a National Scholarship, in mechanics, to the Royal College of Science, London, where he obtained a first-class A.R.C.S. Diploma in physics in 1909 and in mechanics and mathematics in 1910. After demonstrating at the college for less than a year he was appointed assistant to Mr. (later Sir) Clifford Paterson, who was then in charge of the Electrotechnic Division of the National Physical Laboratory. From 1915 until the end of the first World War, Dr. Dudding was in charge of the Screw Gauge Division in the Metrology Department of the N.P.L. and for his services was awarded the M.B.E. in 1918.

In July 1916, Dr. Dudding signed an agreement with the General Electric Company to join Clifford Paterson who had accepted an invitation to found the Research Laboratories of that company. He was thus one of the first two members of the staff of the organization with which he is still connected, and which now has an establishment of more than 2 000. It was not until January 1919 that service with the G.E.C. could begin, when the laboratories were temporarily housed in the company's lamp works at Hammersmith.

In the 32 years which Dr. Dudding has spent in the service of the company, he has covered a wide range of scientific, technical and human problems. He has been particularly concerned with two main technical interests, glass and statistics. He is a Founder Fellow of the Society of Glass Technology and was its President, 1934–36, and President of the International Congress on Glass in 1936. He became Honorary Secretary of the provisional International Commission on Glass in 1948 and of the newly constituted International Commission in 1950.

In the field of statistics, Dr. Dudding has been a Fellow of the Royal Statistical Society since 1933. He was largely instrumental in 1934 in establishing the Society's Industrial and Agricultural Research section, from which, in 1945, the Industrial Applications section developed, with Dr. Dudding as its first Chairman. In 1949 he was elected the sole Vice-President of the newly formed Association of Incorporated Statisticians. He is Honorary Lecturer in Industrial Statistics in the University of Sheffield and is the author of standard publications on control charts.

Dr. Dudding became a Fellow of the Institute of Physics in 1921. He was elected to the Board in 1945 and the following year was elected to succeed the late Professor J. A. Crowther as Honorary Secretary.

Robert Stewart Whipple (*former Vice-President*). Mr. Whipple, now 80 years of age, has devoted his life to the history, development and manufacture of scientific instruments. The son of G. M. Whipple, Superintendent of Kew Observatory, he entered the observatory as an assistant in 1888, leaving eight years later to become assistant manager to L. P. Casella, the well-known instrument manufacturer. Two years later, Mr. Whipple became private assistant to Mr. (later Sir) Horace Darwin, who founded the Cambridge Scientific Instrument Company, of which Mr. Whipple became Manager and Secretary at the end of 1898. In 1909 he and C. C. Mason became joint Managing Directors, a post which Mr. Whipple held until his retirement from active management of the company in 1935. From 1939 to 1949 he was Chairman of the Directors.

Twice President of the Scientific Instrument Manufacturers' Association, President of the Optical Society

in 1920–21 (his presidential address was a summary of the art of scientific instrument making as he had learned it from Horace Darwin), Treasurer of the Physical Society for 10 years and a Vice-President of it for another three, President of Section A of the British Association Meeting in Dundee in 1939 and Faraday lecturer of the Institution of Electrical Engineers in 1936–37, Mr. Whipple has not spared himself in serving scientific societies. His service to the Institute of Physics dates from the Institute's foundation and his name is one of the 17 given in the original memorandum of association in 1920. He has served on the Board for no less than 21 years, in five spells from 1920 until 1945. Since that date he has continued to serve on the Finance Committee, the meetings of which he still regularly attends. Mr. Whipple's judgment and experience have been invaluable to the Institute in its development. He has, too, made generous material gifts.

Mr. Whipple devoted his leisure time over many years to the study of the development of scientific instruments and to the collection of specimens of historic interest. In 1944 he presented his valuable collection of instruments and books to the University of Cambridge and they are now displayed in the museum devoted to the history of science. The 1 500 volumes included first editions of the works of Gilbert, Bacon, Galileo, Boyle, Hooke and Newton. The specimens included astronomical instruments from the sixteenth century onwards, a collection of microscopes containing examples from the time of Robert Hooke onwards, and numerous surveying, mathematical and physical instruments.

Mr. Whipple is a Member of the Institution of Electrical Engineers.

Edward Roy Davies, O.B.E., B.Sc. (*Honorary Treasurer*). Born in 1903, Mr. Davies graduated in physics at King's College, London, in 1925. In 1926 he joined the staff of Thomas Illingworth and Co. Ltd., photographic paper manufacturers of Ilford, and was also associated with the British Photographic Research Association, beginning there a close personal friendship with Dr. F. C. Toy, then Chief Physicist to the Association and recently President of the Institute. Five years later, when only 27 years old, he succeeded Dr. Walter Clark as head of the research laboratory of Kodak Ltd.; Mr. Davies is still the Director of this important industrial research laboratory. In 1946 he was awarded the O.B.E. in recognition of his wartime services, mainly to air photography.

Mr. Davies became an Associate of the Institute in 1928 and a Fellow in 1932. He served on the Board as Chairman of the London and Home Counties Branch from 1937 to 1943 in which year he was elected a Vice-President. In 1946 he succeeded the late Major C. E. S. Phillips as Honorary Treasurer and has had the responsibility of guiding the Institute's financial affairs through a period of great expansion which has included the aquisition of the present Headquarters and the large increase in the volume of the Institute's publications. For some years Mr. Davies was Chairman of the Membership Committee of the Board and the broadening of the membership regulations, particularly to give greater recognition to industrial and other non-academic research, owes much to him.

Mr. Davies is a Manager of the Royal Institution and has served on the Councils of the Physical Society and the Royal Photographic Society.

NOTES ON TERMS OF ENGAGEMENT OF PHYSICISTS

Approved by the Board of the Institute on May 17, 1951

These notes are provided by the Board of the Institute of Physics as a guide to its members and to employers which it hopes will assist them in preparing service contracts. While the Permanent Officers of the Institute will always advise on the type of clause that might be suitable in any particular case, members are **strongly** advised to submit all contracts, before signature, to their own solicitors; if there is a dispute and appeal is made to the wording of the service agreement, the legal interpretation is the only one that counts. An experienced lawyer is able to point out where the wording, although quite clear to a layman, is in fact legally ambiguous.

These notes, with a few minor modifications and some additions, are copied from those prepared by a Joint Committee of representatives of the Royal Institute of Chemistry, representatives of member-firms of the Association of British Chemical Manufacturers and representatives of the Standing Committee of Directors of Research Associations (published in the *Journal of the Royal Institute of Chemistry* (Vol. 75, p. 19, 1951)). The Board of the Institute of Physics gratefully acknowledges its indebtedness to those bodies for permission to reproduce these notes, which supersede the document entitled, "A Suggested Form of Contract of Service for Physicists."

Many of the fundamental rights and obligations of employer and employee are already implied by the common law. Evidence of engagement may take many different forms—a formal comprehensive contract of service; a formal contract covering only matters not already implied by law; or a comprehensive or brief letter of engagement with formal or tacit acceptance. Sometimes also, certain terms of engagement are to be found in a special leaflet or handbook issued to employees or available on reference. The Board does not recommend any one particular method; the most appropriate must always depend upon the particular circumstances, but in its view the general terms and conditions of employment should always be placed on record even if it only serves as a reminder to both parties of their rights and obligations under common law and of those not implied by it. No one can predict what difficulties may arise in the course of many years' service, and experience shows the great advantage in such cases of a legally clear document setting out the agreed conditions of service.

The principal matters normally involved in the relationship of employer and employee are the following:—

(1) *Parties.* When the employer is other than a single individual, the engagement should be signed on behalf of the employer by someone with authority to commit the employer, that is the company, corporation, etc. The officers and officials of such bodies change and "understandings" and "gentleman's agreements" may be interpreted quite differently by different people.

A contract of service is personal and in the absence of any contrary provision, can be assigned, even to a subsidiary or parent company, only by consent. Thus an employee of a limited company which is liquidated and struck off the Register is not, without his consent, obliged to serve any other company, nor is that other concern legally obliged to employ him. His rights and obligations would not, however, be affected by a mere transfer of shares, on however large a scale, so long as the employing company retained its original identity.

(2) *Description of Duties or Title.* It is not necessary that the terms of engagement should themselves include a detailed list of the employee's duties; if and when it is desirable that these should be in writing they may indeed be more fittingly included in some other document.

It is, however, desirable that the terms of engagement should very briefly indicate the principal function to be performed by the employee or the title of the post occupied by him. Too broad or too narrow a reference is to be avoided. The importance of reasonable precision in the reference in terms of engagement to the function or title increases in proportion to the seniority of the post involved.

(3) *Period.* The engagement may be for a fixed period, e.g. 3–5 years, or an indefinite term. If, in the case of a fixed period, the employment continues beyond the end of the period without any further terms of engagement being agreed, then the employment becomes terminable on either side by reasonable notice. To determine what is reasonable, the law has regard to all relevant circumstances such as the seniority of the post involved and the frequency of payments. To obviate the difficulties so arising, it is useful, even in the case of a fixed period engagement, for the terms of the engagement to include express provision for the period of notice required to terminate it in case it should endure beyond the end of the fixed period.

In the case of an indefinite term it is useful, for the same reason, to provide expressly for the period of notice required for termination.

It is considered desirable that both parties should possess equal rights of termination and that the period of notice required from one party

should be of the same length as that required from the other. Three months is quite usual; a longer period has disadvantages when applying for a new post.

(4) *Salary.* The initial salary payable and the frequency of payment should be clearly stated.

Some employers indicate in the terms of engagement that the salary and/or any increment mentioned is minimum, but in that event a proviso that any such increment shall be subject to the employee having given continued satisfaction in the carrying out of his duties cannot be objected to.

(5) *Superannuation, Pension Schemes and Sickness Benefits.* It is quite usual for the terms of engagement to state that the physicist is required to enter a contributory scheme covering his life, providing for a pension and sometimes for sickness benefits. In such instances he should be clear about his rights and obligations under the scheme and particularly whether these insurance policies are transferable on termination of his contract, and whether the employer's contribution is retained by the employee. He should also ascertain whether he may personally become liable for additional premiums on account of particular laboratory hazards.

(6) *Housing.* Employers sometimes own the accommodation available for their employees and their families, or assist them in the purchase of a house. The conditions of tenancy of such a place or of a mortgage in relation to the termination of employment should be clearly stated.

(7) *Attention to Duties.* That the employee shall faithfully attend to his duties is, of course, implied by the mere relationship of employer and employee, but wording which affords the employer a clear right to require an employee to devote some part of his attention to the business of associated or subsidiary companies is unexceptionable.

Subject to the above, wording purporting to exercise control over the employee's use of his own time should be carefully examined in order that its exact implication is understood. It is always advisable to consult the employer before accepting paid external duties.

It is the practice of some laboratories or works to require all employees to "clock in" and this should not be resisted; usually, however, special arrangements can be made when experimental work requires attendance at irregular hours.

A useful addition to a service agreement is a clause entitling the physicist to reasonable freedom to attend scientific meetings or to visit libraries or other laboratories; sometimes an employer will make a contribution to out-of-pocket expenses incurred in this way.

(8) *Observance of Working Instructions.* No objection can reasonably be taken to wording requiring the employee to observe the regulations and instructions in force from time to time, particularly in the case of the larger employer where responsibility is necessarily much delegated.

(9) *Trade Secrets and Publications.* It is useful, if only as a reminder, to provide in express and clear terms what is already a common law obligation—namely that the employee shall preserve at all times the trade secrets of his employer. Many employers are ready to add that consent to publication of scientific work will be given where the employer's business will not thereby be prejudiced. Clauses which may restrict the physicist's freedom to publish matter quite unrelated to his work should be carefully examined.

(10) *Return of Property.* A requirement calling for the handing over of property of the employer (including records of the employee's work) that may be in the custody of the employee at the termination of his engagement is reasonable.

(11) *Inventions and Discoveries.* Terms of engagement often provide (what is in any case implied by law) that rights in inventions and discoveries made by the employee during the period of his employment and relating to matters which are the subject of his duties or investigations belong to the employer. The latter's rights to patent or otherwise protect such inventions and discoveries and to require the employee to sign documents to implement such rights are accordingly reserved.

In the absence of express provision to the contrary, the remuneration provided by terms of engagement is normally regarded as covering the reward of the physicist for discoveries and inventions made by him in the ordinary course of his duties to his employer.

When there is provision for royalties to be paid to the employee, these might take the form of a percentage (say 3–5%) on the sale price of the device in the United Kingdom; special provision should be made with regard to licence fees or other capital sums.

(12) *Salary during Illness.* It is desirable to make express provision on this topic. Arrangements differ, but it is equitable that the normal salary, less State sickness benefit, shall continue payable for a reasonable period (which may be related to length of service) before either party has a right to terminate the engagement.

(13) *Holidays.* It is desirable that the length of the annual holiday to which the employee is to be entitled be clearly stated.

(14) *Termination of Engagement.* An engagement becomes terminable by one of the parties upon the

failure of the other to perform any of his obligations. The injured party is entitled to treat the agreement as at an end and to claim from the other damages for breach of contract. An employer is not legally bound to give a reason for termination of employment unless the terms of engagement specifically require him to do so. He must, however, give the due notice required by the agreement or payment in lieu of it.

An engagement is automatically terminated by mutual consent, on new terms of engagement being agreed and substituted, on the expiration of a fixed term, on death of one of the parties or on the happening of any event stipulated in the terms of engagement to bring them to an end, such as the expiration of due notice.

(15) *Mutual Procedure for giving Notice of Termination.* When the engagement takes the form of a formal contract, it is not unusual to specify the address to which notice must be sent and the mode of delivering or posting.

(16) *Stamp Duty.* It is advisable for formal contracts of service to be stamped with the appropriate revenue duty (10s. if under seal, 6d. if not) as this facilitates their use in evidence.

(17) *Restriction of Activities after Termination of Engagement.* There is an obligation under the common law upon an employee to preserve the trade secrets of his employer and not to entice away the employer's old customers. Some employers, however, seek to impose, in the terms of engagement, additional restrictions on the activities of the employee after the termination of his engagement.

Nothing can deprive the employee of his right to use to his own advantage his own skill and ability but, subject to that, an employer is entitled to impose such degree of additional restriction as may be essential to protect his legitimate interests. It is admittedly difficult to define the degree of additional restraint that may be regarded as reasonable in given circumstances and the validity of such restraint clauses can be tested only by recourse to a court of law. It is believed to be in the interest of both parties that employers should insist only upon such restrictive clauses as are considered essential for their protection, and that where a clause imposing additional restraint is included in a contract the scope and period of the restraint should be clearly stated. Adequate financial consideration for such additional restraint should be provided in the terms of engagement.

(18) *Transfer between Establishments: Expenses.* Service overseas or at another establishment of the employer distant from that where the employee was engaged to work and not in contemplation at the time of making the engagement, may constitute so great a change in practice as to suggest the desirability of revised terms of engagement. If, however, the engagement makes provision for service at different and widely separated establishments of the same employer, it is reasonable that it should also provide for meeting the expenses of various kinds which the employee may thereby incur.

(19) *Arbitration.* Unless terms of engagement contain provision for a dispute to be referred to arbitration, litigation is the legal method of settling it. Most aspects of the law of employer and employee have received the attention of the courts of this country for many centuries and a very sound and sure legal code has thus been established. On the other hand, arbitration is generally speedier and less costly than litigation.

NEWS OF MEMBERS

Fellows

The Honours List published on His Majesty's Birthday included the names of the following three Fellows:

Knight Bachelor

H. W. H. Warren.

C.B.E.

W. R. G. Atkins.
G. M. B. Dobson.

J. G. Holmes has been elected President of the Illuminating Engineering Society for 1951–1952.

F. H. C. M. Minnis has been appointed a Principal Scientific Officer at the Radio Research Station, Ditton Park, Slough, Bucks.

S. H. Piper has been appointed to a Chair of Physics in the University of Bristol. This has been specially created for him in recognition of his services to the Bristol School of Physics.

Associate

R. L. Whitmore is now Head of the Mechanical Sciences Department, Research Division, Ferodo Ltd., Chapel-en-le-Frith, Stockport.

"*It takes a very remarkable man to assess the quantum of his own ignorance.*"

F. SHERWOOD TAYLOR.

NOTICES TO MEMBERS

Courses in Applied Physics

Members will be interested in particulars which have recently been received of a new physics degree course to be established at Manchester, and of the course in applied physics leading to the Associateship of the Royal Technical College, Glasgow.

A new physics degree course is to be established in the Faculty of Technology in the University of Manchester. This course, which will lead to the Ordinary degree of B.Sc.Tech. and the Higher degree of B.Sc.Tech. with honours, will be under the general direction of Dr. H. Lipson (Fellow), Head of the Department of Physics in the College of Technology.

The aim of the course is to provide a basic training in physics in which the emphasis will be upon practical applications rather than theoretical advances; the college provides exceptionally good opportunities for the illustration of the application of physics to other subjects, and students who pass through the course should be particularly suitable for industrial appointments. It is hoped that the course will attract those students whose interests lie mainly in the practical side of physics, and that, in this sense, the course may be regarded as complementary to the physics course offered by Professor Blackett's department in the Faculty of Science.

The course at the Royal Technical College, Glasgow, is under the direction of Professor J. S. Rankin (Fellow), Head of the Natural Philosophy department in the college. It is a four-year honours course with physics and mathematics in each year. Additional subjects include heat engines, electronic engineering, metrology, physical chemistry and engineering metallurgy. In two years of the course, applied physics is included, the branches studied including applied optics, vacuum physics, electron microscopy, X-ray technology and molecular physics.

This Associateship course is now in its third year and there will be at least 20 students in attendance during the coming session.

Regulations Regarding Publications and Extra-mural Work of Scientists in the Colonial Service

One of the constituent institutes of the Joint Council of Professional Scientists recently drew the Council's attention to the varying interpretations, in respect of scientists in the service of Colonial Governments, which are placed on paragraph 52 of Colonial Regulations No. 88-1 (1945), viz.:

"An officer whose remuneration is fixed on the assumption that his whole time is at the disposal of the Government is prohibited from engaging in trade, or employing himself in any commercial or agricultural undertaking."

While agreeing that it is undesirable for servants of Colonial Governments to act as consultants to industrial firms, the Joint Council expressed the view to the Colonial Office that it was not in the best interests of the service for this rule to be interpreted in such a way that it would prevent a scientist acting, for example, as a university examiner or undertaking other academic work or contributing to scientific literature in the ordinary way. The Council's view was that much would be gained if scientific members of the staff of an establishment were free to undertake such extra-mural work as the Director of Research, or other responsible officer, expressly approved and if these Directors and officers had wide discretion in authorizing such work and in deciding what extra-mural activities they themselves should undertake. These views were submitted to the Colonial Office in a document signed by its Chairman and the Presidents of its four constituent bodies; The Institute of Biology, The Royal Institute of Chemistry, The Institution of Metallurgists, and The Institute of Physics.

The Assistant Under Secretary of State for the Colonies in charge of research, both in interview and in correspondence, pointed out that it is a matter of common practice for scientific officers in the service of Colonial Governments to contribute to scientific literature and in the same way other officers frequently publish matters not excluded by the terms of the Colonial Regulation. He also pointed out that it is by no means uncommon for specialist officers employed by a Colonial Government to undertake, for remuneration, lectures at a University or College in the territory and to serve as external examiners. The official view is that in general the regulations are interpreted reasonably from the point of view of both scientific and other officers and of the Colonial Governments, but the Secretary of State has undertaken to enquire into any particular case where it is considered that an unduly strict interpretation of the relevant Colonial regulations has been adopted.

Courses and Examinations for Instrument Maintenance Mechanics

The City and Guilds of London Institute announces the adoption of a new scheme of courses and examinations in instrument maintenance.

The scheme is intended to meet the needs of mechanics and technicians concerned in the maintenance, repair and installation of the instruments used for process and production control in industrial plants and in H.M. Forces. Particular attention is given to the requirements of the chemical, iron and steel, and petroleum industries, to fuel economy and the needs of the

Services, but the structure of the scheme is such that it will be found to have wide application.

The course of part-time study is of five years duration, with an Intermediate examination at the end of the third year, and a Final examination at the end of the fifth year. There is provision for students holding an appropriate Ordinary National Certificate to enter the course at the beginning of the fourth year.

A pamphlet containing the regulations and syllabuses for the City and Guilds examinations will be available shortly, price 6d., from the City and Guilds of London Institute, Department of Technology, 31 Brechin Place, London, S.W.7. Further information about this scheme (subject No. 79) may be obtained from the same address.

Bequest of Books

The Board gratefully records the bequest of books under the will of the late Mr. A. W. Lay, of Chelmsford, who was a Fellow of the Institute and who died last year.

False Representation

Members are warned that a woman claiming to be well known to one or other of the Officers of the Institute has, on two or three occasions, obtained money from members. Any member who is approached with such a claim is advised to verify its genuineness.

APPOINTMENTS VACANT

The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.

The Ministry of Supply invites applications from **Physicists** and **Electronic Engineers** for unestablished appointments in the **Scientific Officer** and **Experimental Officer** classes at **The Radiochemical Centre**, Amersham, Bucks.

The duties are concerned with many aspects of experimental work with radioactive materials, such as measurements and standardization, health physics and instrument development, construction and maintenance.

Candidates for S.O. posts should have a first or second class honours degree in Physics or equivalent and preferably should have had experience in nuclear or hospital physics.

Candidates for E.O. posts should have minimum qualifications of Higher School Certificate or equivalent. Higher qualifications would be an advantage and experience in the design and maintenance of electronic equipment is desirable.

Starting salary will be determined on age and on an assessment of the successful candidates' qualifications and experience, within the ranges:

Principal Scientific Officer	£960 to £1 295
Senior Scientific Officer	£670 to £860
Scientific Officer	£380 to £620
Senior Experimental Officer (minimum age 35)	£705 to £895
Experimental Officer (minimum age 28)	£495 to £645
Assistant Experimental Officer	£220 (at age 18) to £460

Rates for women somewhat lower.

Housing accommodation may be available to successful candidates if married.

Application forms are obtainable from The Radiochemical Centre, Amersham, Bucks.

Electronic Engineer or **Physicist** with practical experience in production and testing of electronic equipment required to organize a new section. Technical qualifications desirable. Previous experience essential. Minimum age 30. Salary £600–£750. Apply: **Nash and Thompson Ltd.**, Oakcroft Road, Tolworth, Surrey.

Physicist (Graduate) required to carry out physical tests and investigations arising out of the manufacture and development of electric cables and telephone exchange equipment. Applications stating training, qualifications, experience and salary required should be made to Ref. 275, **Siemens Brothers and Co. Ltd.**, Woolwich, S.E.18.

A Graduate (or equivalent qualification) in Chemistry, Physics or Chemical Engineering required as **Assistant** in Works Chemist's Department of a large modern paper mill. The work is mainly concerned with technical control and development on plant, rather than in the laboratory. Experience of the paper industry is not essential. Salary according to qualifications and experience.

Hostel accommodation is available for single man.

Applications to Chief Mill Chemist, **Albert E. Reed and Co. Ltd.**, Aylesford Paper Mills, Larkfield, Nr. Maidstone, Kent.

Vacancies exist for honours graduates in physics on the staff of the **British Ceramic Research Association**, for research work in connection with the pottery industry. The salary ranges are £400–£600 for **Scientific Officers**, and £600–£900 for **Senior Scientific Officers**, and the posts are pensionable under F.S.S.U. Applications, together with details of age, qualifications and experience, should be addressed to the Director, British Ceramic Research Association, Queens Road, Penkhull, Stoke-on-Trent.

The **Atomic Energy Research Establishment**, Harwell, Berks, requires **Experimental Officers** for the Engineering Laboratory, to work on experimental problems connected with atomic energy projects. Candidates should have had practical experience of mechanical engineering development work, or of experimental work in one or more of the following fields, (*a*) heat transfer; (*b*) aero or hydrodynamics; (*c*) instrumentation; (*d*) high pressure systems; (*e*) experimental stress analysis; (*f*) small electrical machines and servo mechanisms; but other suitable experience will be considered. Higher National Certificate, Associate Membership of Institution of Mechanical or Electrical Engineers, or recognized degree in engineering or physics, or equivalent qualification is required, but consideration may be given to a lower standard of formal qualification for candidates with outstanding practical experience. Posts will be on a temporary basis in first instance, with prospects for establishment for suitable men.

Salary scales:
Senior Experimental Officer (minimum age 35) £705–£895.
Experimental Officer (minimum age normally 28) £495–£645.

Also vacancies for Assistant Experimental Officers. Minimum age 18, salary range £240–£505.

Applications should be forwarded to: Deputy Chief Engineer, Atomic Energy Research Establishment, Harwell, Nr. Didcot, Berks.

Applications are invited for the post of **Research Assistant** for Electron Microscopy, at a salary between £400–£600 a year, according to qualifications and experience. The appointment will be made for one year in the first instance. Applications should reach the Registrar, **The University, Leeds 2** (from whom further particulars may be obtained) not later than July 16th, 1951.

The British Iron and Steel Research Association require a **Physicist** or **Engineer** to join a research team investigating deformation of metal, particularly the rolling process. University degree in Physics or Mechanical Engineering with Mathematics subsidiary essential. Previous experience in Industry an advantage, but not essential. Salary £500–£650, according to age, qualifications and experience. Location of work, Sheffield. Written applications only, quoting "Rolling" and giving full curriculum vitae to the Personnel Officer, B.I.S.R.A., 11 Park Lane, London, W.1.

Physicists required by well-known firm of instrument makers in London for laboratory work in connection with the development of scientific instruments and apparatus. Previous experience not necessary, but applicants should preferably hold a degree in physics or light electrical engineering. Apply, giving full details of training and experience and stating age and salary required, to Box No. A.V. 14, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

University College Hospital, Gower Street, W.C.1, invite applications for **Junior Assistant Physicist** for duties mainly in connection with Radiotherapy. Previous hospital experience an advantage. Students expecting to graduate this summer invited to apply. Salary (pending national scales) £350 × £25–£450 p.a. but starting at £400 p.a. if successful applicant has 1st or 2nd class Honours degree.

Applications, giving names and addresses of two persons to whom reference may be made, should reach The Secretary of the Hospital, by July 20th, 1951.

A Sales Assistant who should have experience of X-Ray Crystallography and Geiger Counters is required. He must have a knowledge of scientific German and be prepared to travel throughout the United Kingdom. Apply Box A.V.13, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

The British Iron and Steel Research Association is offering four **Bursaries** for post-graduate research in Physical Chemistry, tenable at the Imperial College of Science and Technology. Applications for these bursaries are invited from graduates in Chemistry, Physics or Metallurgy, who are holders of a good honours degree. Researches cover fundamental investigations into the physical chemistry of liquid alloys, slags, and mixed oxide and metal-gas systems. Value of the bursaries will be £250–£315 p.a. according to age, qualifications and residence. Commencing October, 1951, these bursaries will be tenable for one year in the first instance, but, subject to satisfactory work and progress they will be reviewed as necessary to complete the research which is intended to lead to the degree of Ph.D.

Written applications only giving full curriculum vitae to Personnel Officer, B.I.S.R.A., 11 Park Lane, W.1.

Crompton Parkinson Limited invite applications from graduate **Physicists** with good Honours Degrees to work in their Lamp Development Laboratory on Electric Discharge Lamps and Control Gear. Applicants with or without experience will be considered. Good prospects for man wishing to make a career in Industry. Send full particulars of training and practical experience, if any, to Ref. GLD, Crompton Parkinson Ltd., Guiseley, Nr. Leeds, Yorkshire.

Young Physicist, with—or likely to obtain—1st or 2nd class Honours Degree, is offered interesting and progressive employment in modern, expanding, rubber research laboratories.

Candidates should be interested in classical physics (in contrast to electronic). A knowledge of rubber technology is not essential, since such will be acquired during training. Some academic or industrial research experience would prove an asset.

Commencing salary not less than £450, and depending upon qualifications and experience.

Superannuation scheme. 5 day week.

Full particulars, age, education, etc., to Group Research Laboratories, **British Tyre and Rubber Co. Ltd.,** Burton-on-Trent.

Physicists and **Physical Chemists** are invited by the **Ministry of Supply** to apply for an unestablished appointment in the **Experimental Officer** class at a Research and Development Establishment near London, to operate an electron microscope and to assist in X-ray crystallographic work. Acceptable minimum qualifications include, Higher School Certificate with Physics or Chemistry as a principal subject and Higher National Certificate in Physics or Chemistry. Candidates with a degree or diploma in Physics or Chemistry and or relevant experience would be likely to have some advantage. Salary will be determined on age and on an assessment of the successful candidate's qualifications and experience within the following ranges:—Senior Experimental Officer £742 to £960 (minimum age 35). Experimental Officer £454 to £695 (minimum age normally 28). Rates for women somewhat lower. Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting A/180/51A. Closing date July 31th. 1951.

Required for Technical Division of Paperboard Mill, an **Instrument maker-Technical assistant** for construction and use of apparatus for research work. Knowledge of metal working, including use of small machine tools required, and some knowledge of glass working, if possible. Scientific training to School Certificate standard desirable and possession of National Certificate in Applied Physics an advantage. Remuneration £7–£8 a week according to qualifications and experience. Reply to St. **Anne's Board Mill Company Limited,** Bristol 4.

The Governors of **Sir John Cass College,** Jewry Street, London, E.C.3, invite applications for the following full-time appointments from the 1st September, 1951, or as soon as possible after that date:—

Lecturer in Inorganic Chemistry,
including Spectrochemical Analysis.
Lecturer in Applied Mathematics.
Lecturers in Physics.
Lecturer in Zoology.

Applicants should have an honours degree and preferably a higher degree, together with teaching and research experience.

The work is of University special and general degree standard in each subject and may include some teaching of Intermediate science students.

Salary according to the Burnham (Technical) Scale 1951, £900—£25—£1 000 for men or £720—£20—£800 for women, plus London allowance £36 or £48.

Details and form of application, which should be returned as soon as possible, may be obtained from the Principal.

DIARY OF INSTITUTE MEETINGS

Members may bring guests to any of the meetings listed below unless otherwise indicated. Individual notification has been or will be sent to the members of the Branch or Group concerned. Other members of the Institute may obtain further particulars from the Secretary of the Institute.

Friday, Saturday, July 20th and 21st (Education and Electronics Groups). **Joint meeting at the University of Cambridge.** The programme includes visits to the Engineering Laboratories and the Cavendish Laboratory.

Monday, Tuesday, Wednesday, July 23rd, 24th and 25th (Industrial Radiology Group) at the Institute's House, 47 Belgrave Square, London, S.W.1. **Summer Meeting and Exhibition.**

Saturday, July 21st (London and Home Counties Branch). A visit to the **Cavendish Laboratory, Cambridge.**

UNWIN BROTHERS LIMITED, WOKING AND LONDON